



# INSIGHT

A Newsletter for Cancer Survivors in New Jersey

A Special Report  
published by the New Jersey Commission on Cancer Research

*INSIGHT*, written for cancer patients, their families, and cancer survivors, is a unique health care newsletter that provides readers with the information they need to make informed decisions about their health care options. *INSIGHT* helps readers understand critical issues in cancer research, prevention, treatment, and supportive care.

## Message from the Chairman

As the Chairman of the New Jersey Commission on Cancer Research, I am honored to present to you this special edition of *INSIGHT*.

Consistent with its legislative mandate, the Commission focused its efforts during the past year on basic research directed to increase our understanding of this disease and reduce morbidity and mortality related to the disease. Toward this goal, the Commission awarded twelve grants and twenty-two fellowships, totaling over \$1million.

We have found that past investigators supported by the Commission have, in large part, remained within New Jersey, have contributed to a significant increase in research dollars flowing into the State, and have provided an invaluable resource to research, educational, and corporate entities.

On the following pages, our Executive Director, Ann Marie Hill will provide some insight into the issues surrounding the funding of cancer research. I hope you will find this issue of *INSIGHT* as informative as I have.

Paul E. Wallner, D.O.  
NJCCR Chair

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## A Conversation with Ann Marie Hill

A major activity of the New Jersey Commission on Cancer Research is funding research into the causes, prevention and treatment of cancer. Almost everything we do in pursuit of the mission to eradicate cancer and enhance the quality of life of those living with cancer depends on research – whether it is laboratory research which investigates basic cell functions or a clinical trial which seeks to conclude whether one treatment option is better than another.

On the following pages, I will answer some questions frequently posed to me about funding research.

In addition, several grant proposal that have been awarded by the Commission will be listed to help you better understand some of the innovative science New Jersey investigators are working on.

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## 2001 COMMISSION MEMBERS

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## A Conversation With Ann Marie Hill

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**Q:** *Why does the New Jersey Commission on Cancer focus so much of its efforts on funding research?*

**A:** Research generates new insights into human biology and the disease process, identifies factors that affect the health of people and communities, and leads to the discovery of new treatments and ultimately, the prevention of cancer.

The long-range goal of the NJCCR is to ensure that the citizens of New Jersey receive the fullest benefit of our nation's fight against cancer. We cannot do that unless we get answers to the many questions that surround cancer – and that takes strong scientific research. Cancer is a disease where we need to reach deep inside our cells to figure out what is happening. This means that we need to understand all those basic processes that make cells living things. That's quite a challenge, but we are really moving forward in science and I am so optimistic about the future.

**Q:** *Why should it matter to me that research is carried out in New Jersey? If researchers in other states discover advances and improvements, won't I still benefit?*

**A:** Of course, New Jerseyans will benefit from cancer research that is carried out throughout the nation. But, for a number of reasons, it is important to make sure that strong cancer research is carried on throughout our state. A vibrant research community in New Jersey has a significant impact on the health care you receive in your local community – researchers bring cutting edge science right to your back yard. By working closely with community physicians and healthcare providers, the most modern procedures and technologies become available faster. This is especially true in New Jersey, which is home to so many leading pharmaceutical and biotechnology companies. Also, cancer is complex and sometimes requires very specialized care. Such experts can often be found in research centers.

There are also huge economic benefits to having strong cancer research concentrated in New Jersey. Jobs are created. Training programs make highly skilled workers available for our pharmaceutical companies and the health care industry. New companies are more likely to locate where science prospers. It just makes good sense for us to do everything possible to build a program of strong cancer research in our state.

**Q:** *Why does it take so long to translate laboratory results into clinical practice for the use and benefit of patients?*

**A:** It is true that there is usually a gap between new discoveries and treatment advances. While scientists may experience a leap in their understanding of a specific cancer problem, that does not mean that it will be readily translated into the clinic. This is because cancer in humans is far more complex than the most sophisticated system devised in the best laboratory. Cancer cells interact with normal cells around them; they can hide from our bodies natural defenses, our immune system; they can multiply out of control

without dying; they can build networks of blood vessels to feed themselves; and they spread and invade healthy tissue. Sometimes approaches that seem to work so well in a lab do not work in real life.

It's very important to realize that the "state of the art" treatments that you hear about are almost all experimental therapies – that must be carefully tested prior to being used everyday. Clinical trials are research studies that help us know whether new drugs or procedures are safe and effective in people. Through clinical trials, we learn how to treat cancer better and patients may have access to new drugs earlier than otherwise possible. But, the steps required to bring a new drug or procedure to the bedside takes years of hard work and evaluation. Every step is carefully watched and reviewed so patients are not put at risk.

When you are very sick, it is very hard to wait for science to move forward. You want the answers now...not later. But sometimes when we rush ourselves...we do not find the right answers. Think about our experience with breast cancer and bone marrow transplantation. A few years ago, some women began to insist on having bone marrow transplantation for advanced breast cancer outside of clinical trials. They thought that this treatment was better because it was new and exciting. As a result, they did not participate in clinical trials and it took us much longer to discover that this treatment might not be as beneficial as we first thought (studies continue on this subject.) The careful design of research exists for the benefit and protection of patients – so while it takes a long time to find answers, please understand that we take all these precautions to be sure that our treatments are safe for you!

**Q:** *Why is cancer research so expensive?*

**A:** It takes a lot of resources – both monetary and human – to run a successful lab. A New Jersey scientist running a lab for one year could spend in the range of \$50,000 to \$500,000. In fact, labs often share things in order to reduce costs and help the money go further. Items which are taken for granted – but which are very expensive – include

liquid nitrogen for keeping tumor samples preserved, thousands of test tubes, special disposal of wastes, etc.

Some general costs include:

- New techniques such as microarrays that use computer chips to display huge chunks of genetic information cost over \$1.5 million.
- Microscopes can be \$15,000 to over \$100,000; Sophisticated, three-dimensional (confocal) microscopes might be \$400,000;
- Centrifuges are \$40,000 and specialized ultra-cold freezers can cost up to \$10,000;
- One lab technician for one year could cost \$30,000 to \$50,000 (depending on the locale and seniority of the technician);
- Enough cancer cells for one experiment, including shipping, could be \$300 to \$500.

Clinical research is even more expensive with estimates of nearly \$2-4 billion to bring a new drug to market. But, let's put this cost in perspective. Less than a nickel of every health care dollar spent in this country goes to medical research. Cancer is the number one health concern of our citizens here in New Jersey. We all know that research saves lives. You have told us through surveys that research is very important and you are willing to pay for it!! Furthermore, you tell us that you want New Jersey to be a leader in medical research. So my question is: ***WHY AREN'T WE SPENDING MORE MONEY ON CANCER RESEARCH?***

**Q:** *Are we really making progress in cancer research?*

**A:** Cancer is a disease of genes that break down or mutate. Cancer research was revolutionized in the 1980s when scientists began to understand how genes cause cancer. In fact, the 1989 Nobel Prize was won by U.S. researchers discovering how a normal cell can multiply out of control and become malignant because of defects in the genes of a normal cell.

It is this type of profound insight that has led researchers to the edge of a new era in cancer research: an era that will let us target the very

genes that may cause cancer. New “molecular drugs” are now on the drawing board that may help switch cancer cells back to normal again, or kill them without harming healthy cells. With the mapping of the human genome, we are beginning to understand our molecular makeup and the opportunities to charge forward against cancer are incredible.

Standing where we are now, progress may seem to be proceeding at a slow pace. However, it is important to remember that science, like cancer itself, proceeds step by step. If the last 20 years have yielded so many remarkable insights into how cancers develop, the possibilities for the next 10 or 20 years simply boggle the mind. The key to those possibilities lies in the research efforts being funded today. The Commission is doing everything it can to support cancer research. I believe that New Jersey is a rising star in the fight against cancer and we can be proud of our many contributions. But we all need to do more. The words of Will Rogers come to mind when he says, “Even if you are on the right track, you’ll get run over if you just sit there.” So, let’s all climb on board and support cancer research in New Jersey.

### **A SAMPLE OF GRANT PROPOSALS RECENTLY FUNDED BY THE COMMISSION**

In order to give you a better understanding of the type of innovative research the Commission is funding, we have included a few proposals that were recently funded by the Commission.

***Genesis of cancer-causing chromosomal translocations***, Abram Gabriel, M.D., CABM, Rutgers, The State University.

Chromosomal translocations are a hallmark of many types of cancer. Translocations occur when chromosome arms from two different chromosomes break and rejoin with each other. This can result in gene fusion and activation of oncogenes, with consequent neoplastic transformation or tumor progression. It is believed that all leukemias and lymphomas may originate from initial translocation events. Almost nothing is known about the molecular mechanisms

involved in the genesis of chromosomal translocations. This is in part due to the fact that in human cells translocations are rare and hard to detect at the time of their formation. An understanding of the genetic and environmental factors underlying translocation formation could have great implications for cancer prevention, identification of at-risk individuals, and rational design of chemotherapeutic drugs. We have developed an assay system in the model organism *Saccharomyces cerevisiae* that easily detects these rare translocations. This gives us a unique tool to study translocation formation in an experimentally accessible system.

In this grant we propose to examine the role of two yeast genes (SGS1 and RAD9) in translocation formation. Mutations in the human counterparts of these genes are associated with chromosome instability and cancer-prone syndromes. Further, we will study the role of topoisomerase II (topo II), as well as cancer chemotherapy drugs, which target topo II, on the formation of translocations. Finally, we will take an 8,000 base fragment of human DNA from chromosome 11, insert this into a yeast chromosome, and study its ability to generate translocations. This human fragment is particularly interesting because it is the site of translocation formation in almost all leukemias that tragically result in ~15% of patients treated with certain common topo II inhibiting drugs.

***Analysis of Drug Resistance by DNA Microarray***, Khew-Voon Chin, Ph.D., The Cancer Institute of New Jersey.

Drug resistance in cancer chemotherapy is one of the major causes of treatment failure. Factors that cause resistance are still poorly understood. Intense research in this area indicates that the activities of a large number of genes when altered can contribute to drug resistance in cancer. The proposed research attempts to study the factors that cause drug resistance in cancer chemotherapy using the method of DNA microarray or gene chip. This approach will enable us to potentially survey all the genetic pathways and also discover hitherto unrecognized novel genes that may be involved in drug

resistance. In this way, we can better understand the genetic components of drug resistance. Furthermore, the discovery of novel genes by this approach coupled with the genetic and biochemical analyses may unravel the mechanisms of drug development, or treatment strategies, for the circumvention of drug resistance.

To accomplish this, we propose to study the pattern of gene expression that may be associated with drug resistance using cell lines that has been selected for resistance to chemotherapeutic agents. Expression pattern of the drug resistant cells will be determined using a 5,000 human gene microarray. Functional studies will also be conducted to verify the roles of these genes in drug resistance.

***The C-Ret Signalling System in Kidney Morphogenesis***, Julie Drawbridge, Ph.D., Rider University.

Inherited or spontaneous mutations in the proto-oncogene c-Ret can cause a variety of neuroendocrine cancers in humans. Ret is the central component of a multi-component cell signaling system. When Ret or one of its accessory molecules is eliminated during embryonic development, improper gut innervation and kidney agenesis results. At first glance, the developmental programs of the two Ret-requiring tissues seems completely dissimilar; they are derived from different embryonic precursors and form anatomically and functionally very different structures. However, both tissues originate at sites distant from their final positions in the embryo and find their destinations by following guidance information distributed along their respective pathways. While the role of other proto-oncogenes in promoting cell migration in cancers and embryonic tissues is well established, the role of Ret signaling in this process has not yet been tested. The goals of this project are (1) to determine when and where the molecular components of the Ret system are expressed during cell migration of pre-kidney cells and (2) to determine whether Ret signaling helps guide these cells to their proper destination in the developing embryo. The results of the proposed experiments

will clarify the function of components of the Ret system in normal cells as well as provide further insight into how misregulation of Ret signaling causes human neuroendocrine cancers.

*Dr. Drawbridge was able to obtain a three-year National Science Foundation grant totaling \$265,00 based on her preliminary data obtained through the above proposal.*



The NJCCR also administers the proceeds raised through the Conquer Cancer license plate. The plate is available at your local Division of Motor Vehicles and can be purchased at any time during the registration cycle for \$50 (over \$40 goes to cancer research), with a \$10 annual renewal fee (100% of the renewal fee goes to cancer research projects).

To date, over 18,690 plates have been sold, raising more than \$880,000 for cancer research. With the consistent success of the license plate, New Jersey cancer researchers can look forward to increased budgets in upcoming grant cycles.

For more information, please call the Commission offices at 609-633-6552.

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## A Consumer's Guide to Understanding Media Reports on Cancer Research

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We are all very interested in the latest developments in cancer research. Many of us scan the headlines every day to learn of new discoveries about the prevention and treatment of cancer. Like some computer game, medical science has become the master key for us, providing clues and directions that will lead us to the magic land of good health. Studies about diet and nutrition have succeeded in capturing our attention. Oat bran, antioxidants, olive oil, garlic, green tea, and certain herbs are among the foods that have been identified as having potential anti-cancer qualities. A newspaper article on Monday tells us that these foods might prevent certain cancers from forming. But by Friday, another report claims that tests found no positive effects with the consumption of these foods. Announcements about promising new treatments and major breakthroughs are also sprinkled throughout the media on a daily basis. Remember how the media reported that new proteins had stopped tumors from developing blood supplies (angiogenesis) and tumors were melting away in mice. It was just a matter of time before cancer was a thing of the past!! At the same time, we hear more and more about people getting cancer. We worry about the cancer threats that lurk around us. Is it the environment...is my cell phone safe to use? These conflicting reports lead to confusion and bewilderment.

### HOW SCIENTISTS COMMUNICATE

Most often, research studies reported in the media were first printed in scientific and medical journals. Researchers communicate with each other through journals and scientific seminars for a number of reasons. First, it allows other

researchers to evaluate the work to see if it is good. The scientific method is very important to discovering what is true and carefully constructed procedures must be followed to do this. Reports of totally new discoveries are rarely found in science journals. The search for answers comes through small steps in a long process. Allowing fellow researchers to determine if the work is valid and can be duplicated by others helps assure that science is based on knowledge.

Second, scientists read journals to share information about new developments. Sometimes, ideas in one area of study may have an impact on a problem in another area of study. While these steps may seem conservative and slow moving to those anxious for new innovations, this process assures that scientific knowledge grows and advances. It is important, therefore, to remember that studies reported in journals are works in progress, and represent small links in a continuing chain of understanding.

### HOW THE MEDIA REPORTS ABOUT CANCER

Newspapers, radio and television report cancer studies from journals, because the public is very interested in learning about new "breakthroughs" in cancer. But journalists do not have the same criteria as scientists for reporting research findings. They may sensationalize some studies or not explain fully the incremental nature of work. Sometimes, a reporter may write a story with a slightly different slant. The information may be correct, but the total impact of it may be exaggerated or highlighted inaccurately. In addition, the media may be used to market new products or developments. It is possible for advertisements to mimic cancer research reports and consumers should be very wary of claims that might sound too good to be true. Also, it is possible for interest groups to pay journals for editorials and supplemental advertising that may look like a research study, but are really marketing schemes for new products.

## SOME DOS AND DON'TS FOR EVALUATING CANCER RESEARCH REPORTS

### DO:

- Be skeptical about claims made for major breakthroughs.
- Consider the qualifications of the researchers. Have they done other studies? What are their track records? Have other researchers reported similar findings?
- Note where the study was reported. Was it in a peer-reviewed journal such as the New England Journal of Medicine, Science, Nature, Cell, Cancer, the Journal of the NCI, etc?
- Consider the type of study completed. Was the clinical study randomized and double blinded? Were large enough numbers included in an epidemiologic study? Was it a study in animals, not humans? Did other scientists question validity?
- Put things in perspective, recognizing that moderation is always the best policy when it comes to diet or lifestyle practices.

### DON'T:

- Assume that the discovery of one link in a series of events means that the whole chain is revealed.
- Equate probability with certainty.
- Presume that an association between two events is the same as cause and effect.
- Believe anecdotal or testimonial stories about instant cures, tumors shrinking to nothing, concoctions to prevent all cancers, and other "too good to be true" claims – they usually are!!

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